



## Long-term shifts in abundance and distribution of a temperate fish fauna: A response to climate change and fishing practices

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**Year:** 2011  
**Journal:** Global Ecology and Biogeography : A Journal of Macroecology. 20 (1): 58-72

### Abstract:

Aim South-eastern Australia is a climate change hotspot with well-documented recent changes in its physical marine environment. The impact on and temporal responses of the biota to change are less well understood, but appear to be due to influences of climate, as well as the non-climate related past and continuing human impacts. We attempt to resolve the agents of change by examining major temporal and distributional shifts in the fish fauna and making a tentative attribution of causal factors. Location Temperate seas of south-eastern Australia. Methods Mixed data sources synthesized from published accounts, scientific surveys, spearfishing and angling competitions, commercial catches and underwater photographic records, from the 'late 1800s' to the 'present', were examined to determine shifts in coastal fish distributions. Results Forty-five species, representing 27 families (about 30% of the inshore fish families occurring in the region), exhibited major distributional shifts thought to be climate related. These are distributed across the following categories: species previously rare or unlisted (12), with expanded ranges (23) and/or abundance increases (30), expanded populations in south-eastern Tasmania (16) and extra-limital vagrants (4). Another 9 species, representing 7 families, experienced longer-term changes (since the 1800s) probably due to anthropogenic factors, such as habitat alteration and fishing pressure: species now extinct locally (3), recovering (3), threatened (2) or with remnant populations (1). One species is a temporary resident periodically recruited from New Zealand. Of fishes exhibiting an obvious poleward movement, most are reef dwellers from three Australian biogeographic categories: widespread southern, western warm temperate (Flindersian) or eastern warm temperate (Peronian) species. Main conclusions Some of the region's largest predatory reef fishes have become extinct in Tasmanian seas since the 'late 1800s', most likely as a result of poor fishing practices. In more recent times, there have been major changes in the distribution patterns of Tasmanian fishes that correspond to dramatic warming observed in the local marine environment.

**Source:** <http://dx.doi.org/10.1111/j.1466-8238.2010.00575.x>

### Resource Description

#### Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes

#### Geographic Feature:

resource focuses on specific type of geography

# Climate Change and Human Health Literature Portal

Ocean/Coastal

## **Geographic Location:**

resource focuses on specific location

Non-United States

**Non-United States:** Australasia

## **Health Impact:**

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

## **Mitigation/Adaptation:**

mitigation or adaptation strategy is a focus of resource

Adaptation

## **Resource Type:**

format or standard characteristic of resource

Research Article

## **Timescale:**

time period studied

Time Scale Unspecified

## **Vulnerability/Impact Assessment:**

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content